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APPLICATION NO. 09/232,498	FILING DATE 01/18/99	MIZUNO FIRST NAMED INVENTOR	ATTORNEY DOCKET NO. 10517/16
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RUTHIKOSKY, M
EXAMINER

1745 ART UNIT	PAPER NUMBER
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07/19/00

DATE MAILED:

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/232,498

Applicant(s)
Mizuno

Examiner
Ruthk sky, Mark

Group Art Unit
1745



☒ Responsive to communication(s) filed on Jan 15, 1999

☐ This action is FINAL.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claim

☒ Claim(s) 1-12 is/are pending in the applicat

Of the above, claim(s) _____ is/are withdrawn from consideration

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-12 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☒ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☒ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 3

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

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DETAILED ACTION

Summary

1. Claims 1-3, 5-8 and 11-12 are rejected under 35 U.S.C. 103(a). Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph. Claims 4, 9, and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Information Disclosure Statement

2. The information disclosure statement filed 9/9/99 has been placed in the application file, and has been considered as to the merits.

Claim Rejections - 35 U.S.C. § 112

3. Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims are to a mixture of a phenol resin and an epoxy resin, however, as these are very generic terms, it is noted that an epoxy resin may also be a phenol resin and a phenol resin may also be an epoxy resin (for example, see Hasegawa (4,369,238), lines 35-50 AND WO 99/19389, claim 8). As the claims are to a mixture, the identities of each component must be clearly defined in order to understand the proper combination.

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4. Claims 3-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The word "type" in these claims is indefinite as it does not distinctly claim the resin. The word "type" should be removed from these claims.

Claim Rejections - 35 U.S.C. § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-3, 5-8 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shigeta (4,956,131), in view of WO99/13989 and further supported by JP 59042781.

The instant claims are to a method of manufacturing a separator for a fuel cell comprising the steps of mixing a carbon, an epoxy resin and a phenolic resin, charging the material into a mold and heat pressing the material.

Shigeta (4,956,131) teaches a process for producing an electrode substrate for fuel cells which includes an electrode substrate and separator assembly where the process includes supplying materials into a mold comprising a filler (carbon particles of 50 microns or less), a binder (can be phenol resins, epoxy resins or mixtures thereof), and a pore regulator mixing and press molding the material (claims 1-4). While this process teaches the binder can be a mixture

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of phenol resins and epoxy resins, it does not teach a process for mixing both types of resins to form a separator.

WO99/13989, however, teaches a structure and molding composition which is presented for use in bipolar plate assemblies in fuel cells (see col. 5). The molding composition comprises mixing a carbon, an epoxy resin and a phenolic resin. The stoichiometry of the epoxy resin to the phenolic resin is disclosed in claims 7 and 13, and on page 18. Novolac and bis-phenol A are disclosed as epoxy resins (claim 8) and novolac phenol resins are disclosed (p 17, lines 10-15). Natural graphite flakes are disclosed on page 7 with preferred sizes (20 microns-4.75 mm and a thickness of about 5-100 microns).

It would be obvious to one skilled in the art at the time the invention was made to combine the molding composition which is presented in WO99/13989 as the binder of Shigeta as the materials are well known to be mixed and bind carbon to form structures such as separators for fuel cells. WO99/13989 provides the motivation to use such a composition on page 5 as the materials resist cracking and resistance to ion leaching in the fuel cell environment while providing enhanced thermal and electrical conductivity. The use of such carbonaceous materials, is very well known in fuel cell assemblies. For example, JP 59042781 (abstract) teaches a method for producing a carbon material for a fuel cell comprising the steps of mixing a carbon powder, an epoxy resin and a phenolic resin, charging the material into a mold and heat pressing the material. Novolac phenol resins are disclosed. The carbon is graphite less than 100 microns in size.

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Allowable Subject Matter

7. Claims 4, 9, and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims although the rejections under 35 U.S.C. 112 must be overcome.

8. The following is a statement of reasons for the indication of allowable subject matter: Claims 4, 9, and 10 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims as claim 4 denotes the epoxy resin to be glycidylamine. This limitation is not suggested in the art of record. Claim 9 teaches the method to include the steps of preparing a powder having a particle size of 50-150 microns and particles size distribution of 50-300 microns by spraying and drying the slurry for granulation. Claim 10 teaches the step of grinding a surface of the separator. These limitations were also not found in the prior art. Thus, these claims appear to be allowable over the prior art.

Examiner Correspondence

9. Any inquiry regarding this communication or a previous communication should be directed to Examiner Mark Ruthkosky, Ph.D., whose telephone number is (703) 305-0587 or his supervisor M. Nuzzolillo whose telephone number is (703) 305-3776. Please note that Examiner Ruthkosky and Supervising Examiner Nuzzolillo are out of the office the first Friday of each bi-week period. The art unit 1745 unofficial fax number is 703-306-3429, while the PTO official fax number is 703-305-3599.

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